

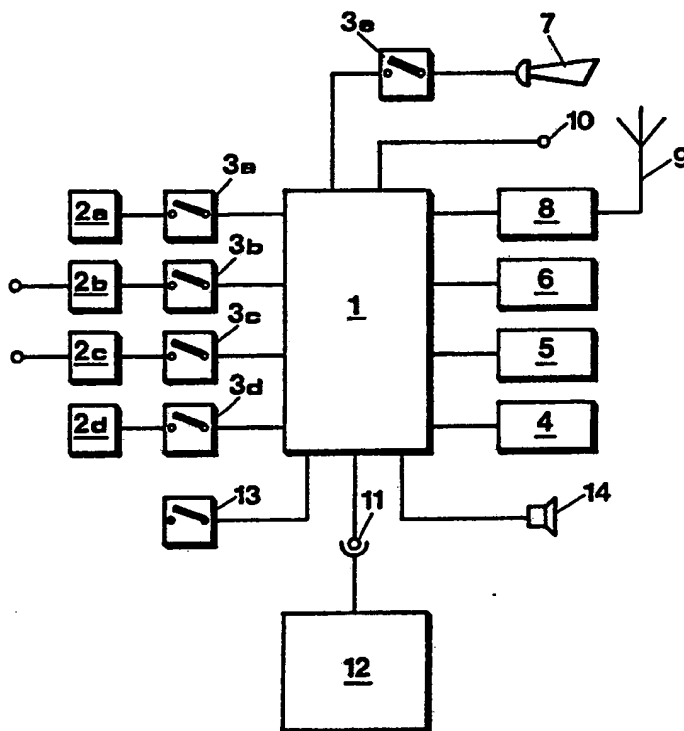


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/SE84/00076 (22) International Filing Date: 5 March 1984 (05.03.84) (71) Applicant (for all designated States except US): PROGRATOR INNOVATION AB [SE/SE]; Box 134, S-448 01 Floda (SE). (72) Inventors; and (75) Inventors/Applicants (for US only) : LARSSON, Bengt-Olof [SE/SE]; Pl. 1405, S-441 90 Alingsås (SE). ZACHRISSON, Lars [SE/SE]; Marbotorpsvägen 109, S-443 44 Alingsås (SE). (74) Agents: ROTH, Michel et al.; Göteborgs Patentbyrå AB, Box 5005, S-402 21 Göteborg (SE). (81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), DK, FI, FR (European patent), GB (European patent), JP, LU (European patent), NL (European patent), NO, SE (European patent),		US. Published With international search report.

(54) Title: MONITOR FOR AN ALARM SYSTEM**(57) Abstract**

A preferably easily movable electronic control unit intended mainly for occasional use e.g., in work shops or store rooms where goods and other valuable material is kept. The control unit can also preferably be temporarily placed during transports at freight containers, railway cars, lorries or the like, which convey valuable goods. The invention incorporates at least one alarm detector for detection of the state of a controlled object and at least one function switch for switching in or switching off respectively, said alarm detectors. The invention is obtained thereby that at least one data memory (5) is arranged to receive and store data/information about the position of the function switch (3a-d) and/or if the function state (true value) of the alarm detectors (3a-d) and the time for the established change in these positions/states.



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Monitor for an alarm system

The present invention refers to a preferably readily movable control unit intended mainly for occasional use e.g. in work rooms or store rooms where goods or other valuable material is kept. The control unit can also preferably be temporarily located during transport at freight containers, railway cars, lorries and the like, which convey valuable goods.

Background of invention

Thefts of valuable goods are unfortunately not an unusual phenomenon neither in our country nor in other countries. By thefts in work shops, industrial premises, store rooms, garages and the like tools, goods and other capital goods are yearly stolen for large amounts. It has also become ever more usual of stealing from freight transports, such as lorries, containers or the like. It is today comparatively difficult in a safe manner to control temporarily parked transports bearing valuable goods, which often during shorter periods of time are left unguarded along the transport track, on industrial premises etc. It can neither be ruled out that the personal of a company purloins valuable goods.

An alternative to the automatic alarm equipments on the market is to arrange for manual control which however means higher costs and is not always so easy to arrange at short notice.

The automatic theft and burglary alarms known today have, however, a plurality of drawbacks. They are at one hand comparatively easy to manipulate and to bring out of function temporarily and it can at the other hand after a burglary be impossible to reconstruct what has occurred at the moment of the burglary, e.g. which alarm detector has set off the alarm. If the alarm has been put out of function in connection to the burglary it is near at hand to suspect somebody from the own personal. At thefts from lorries it can e.g. be near at hand to suspect the driver for the theft.



Purpose and the most important features of the invention

The purpose of the present invention is to provide an electronic control unit by means of which the function state of the control unit and the state of the alarm detector at the moment of the theft or the burglary can be controlled afterwards. Hereby it shall be possible to make a visualization or reconstruction of the course of events at the moment of the theft or the burglary. A further purpose is that the control unit shall be comparatively easy to move, set up and put into operation. The control unit shall furthermore be automatically reset to control position after an intrusion has been detected and been alarmed and to disconnect the incorrect alarm detector device from the alarm circuit. If any alarm detector been put out of function. This has been obtained thereby, that a data memory is arranged consecutively to register and store information about the position of the function switch and/or if the function state (true value) of the alarm detectors and the moment for the established change in these positions/states.

Short description of the drawings

The invention will hereinafter be described as an embodiment under reference to the accompanying drawing, which schematically shows a block diagram over the electronic structure of the invention.

Description of the embodiment

In the figure it is thus shown a control unit according to the invention which incorporates i.a. a central unit 1 to which is connected a plurality, more exactly four alarm detector 2a-d, which are independent of each other and which are connected via four alarm inputs A - D. The different alarm detector 2a-d, an internal self adjusting wire detector 2a, two active and/or passive loop circuit detectors 2b,c for external circuits and one vibration detector 2d located internally in the control unit, can be individually connected



disconnected via function switches 3a - d, connected to the central unit 1. The central unit 1 incorporates besides a micro processor (not shown), conventional electronic components, and is designed with aid of known technique, whereby it is not further described here. To the central unit 1 is connected at one hand a program memory 4 e.g. of EPROMtype, in which the control program for the micro processor and thereby for the control unit is stored, at the other hand a data memory 5 e.g. of C-MOS RAMtype, in which is stored data/information, occurrence data regarding the function state of the control unit. This data/information shows at one hand in which positions the function switches 3a-d are and thus which alarm detectors 2a-d which at each moment of registration are connected or disconnected from the alarm, at the other hand if each alarm detector 2a-d is actuated or not, independently of if the alarm detector 2a-d are connected via the function switches 3a-d or not. Registration of the different states is preferably made regularly with a predetermined time space between each registration. The time space can e.g. be one minute or 100 seconds, and it is controlled by a clock unit 6 having a calendar function. This clock unit 6 is arranged to give a correct time statement together with date at each moment. Also the oscillator (not shown) necessary for the function of the microprocessor can be used, whereby its clock frequency is divided thus that a suitable interval time is obtained. It is of course also possible to register the operation state continuously or each time a change in state comes up in any alarm detector 2a-d or in any function switch 3a-d.

For attraction of attention when an intrusion has been detected by actuation of any of the detector 2a-d an electronic siren 7 is arranged in connection to the control unit, which siren 7 is connected and disconnected resp. via a further function switch 3e. If a "quiet" alarm is desired a radio transmitter 8 with an antenna 9 is arranged to send a selective code, which can be received by e.g. a pocket receiver (not shown). The pocket receiver can e.g. be a conventional person scanner. The transmitter 8 has a range of at



least 2 kilometers. In the event that any other kind of notifying alarm device should be desired an additional alarm output 10 is arranged for connection of one or more external alarm apparatuses. Example of such devices are automatic phone callers, alarm bells or the like.

The control unit can be driven directly via the electric net voltage but it is provided with a backup battery (not shown) by means of which the control unit can be maintained in normal operation 3 - 7 days depending on the number of functions connected. This is made possible thereby that vital parts of the control unit are assembled from current saving components of C-MOS type. Even if the net voltage to the control unit is interrupted the control is thus maintained as if nothing had occurred. Further the battery backup (not shown) feeds only the micro processor, the clock unit 6 and the data memory 5 whereas registration of occurrence data can take place consecutively during a very long period of time (up to one year). Other parts of the control unit however can not operate by means of only this battery backup whereby e.g. alarm can not be set off. Data information about the operation states for the function switches 3a-d and alarm detectors 2a-d are continued to be stored in the data store 5, which data/information can later on be controlled.

If anyone of the function switches 3a-d is changed when the control unit is in control state, i.e. is activated, this will also release an alarm.

The control unit is further provided with an output 11 via which a programming/registrating unit 12 can be connected to the central unit 1. By means of this unit, which can be a conventional data terminal is it possible to program the different functions of the control unit, such as delayed putting the alarm into function, delayed alarm at detected intrusion etc., by means of particular program commands which are stored in the program memory 4. Thus it can be decided that the control unit shall not begin to operate until e.g. two minutes have passed since the operator has switched on the



main current switch 13 on the control unit. This time respit, the switching-in delay, makes it possible for the operator to switch in the desired alarm detectors 2a-d via the function switches 3a-d and then to leave the spot without setting off the alarm although the operator may have to pass through a controlled door. During the switching-in delay the faint summer tone is heard from a summer 14. Also the manipulations made by the operator, i.e. switching-in and switching-off the alarm detectors 2a-d are registred during this switching-in delay and data/information thereabout is stored in the data memory 5. The registrations in the data memory 5 are made independently of if the main current switch 13 is switched on or not.

The control unit can by means of a programming/registrating unit 12 also be programmed to emit acoustic or radio based alarms with a certain delay after a detected intrusion. This allows the operator to reach the control unit and to disengage the alarm without setting of the acoustic or the radio based alarm.

The programming/registrating unit 12 is also arranged to read the content of the data memory 5, whereby occurrence data stored in the data memory 5 can be processed and visualized e.g. in a time and occurrence diagram or in table form (not shown), which can form the basis for possible investigations after a theft or a burglary. Due to the fact that the control unit is provided with a vibration sensible alarm detector 2d it is possible in this manner also to control e.g. driving times for a transport lorry.

By the present invention it is thus possible afterwards to reconstruct and control what has happened and in which time sequence. Unfounded suspicions of e.g. the guilt of the own personal to a crime made can be set aside much more easy and earlier. Statements from lorry drivers about driving times, stops and the like in connection to a theft from the goods transported can easily be varified or controlled etc.



The control unit is further arranged automatically to revert to its control position a certain time after an alarm has been set off. This in order to prevent that the same or another intruder after an alarm has terminated, which alarm may not have been observed and controlled and attended to manually, shall be able to brake in again without risk at a later occasion. An alarm is namely not allowed to sound longer than a certain limited time which is stipulated by law. The central unit 1 is thereby arranged automatically to sense and disconnect the erring alarm detectors 2a-d from their control positions and to continue the control with the remaining intact alarm detectors 2a-d. Erring alarm detectors 2a-d can result from e.g. that a window which has been broken up or a door which has been broken up has not been closed, that an alarm circuit is cut off or that a tongue element in a magnetic switch has terminated to function, which in known alarm systems completely makes maintained control impossible after a first alarm has been set off. The present control unit eliminates thus these drawbacks. If an erring alarm detector 2a-d at a later event is reset the central unit 1 is arranged also to set it in control state again.

The invention is of course not limited to the above described embodiment but a plurality of alternative embodiments are possible within the scope of the claims. It is thus possible that the data memory 5 described in the embodiment beside having a semi conductor memory, also has a tape memory, a disk memory or the like. It is of course also possible to connect a larger number of alarm detectors 2a-d than the four which have been described.



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C L A I M S

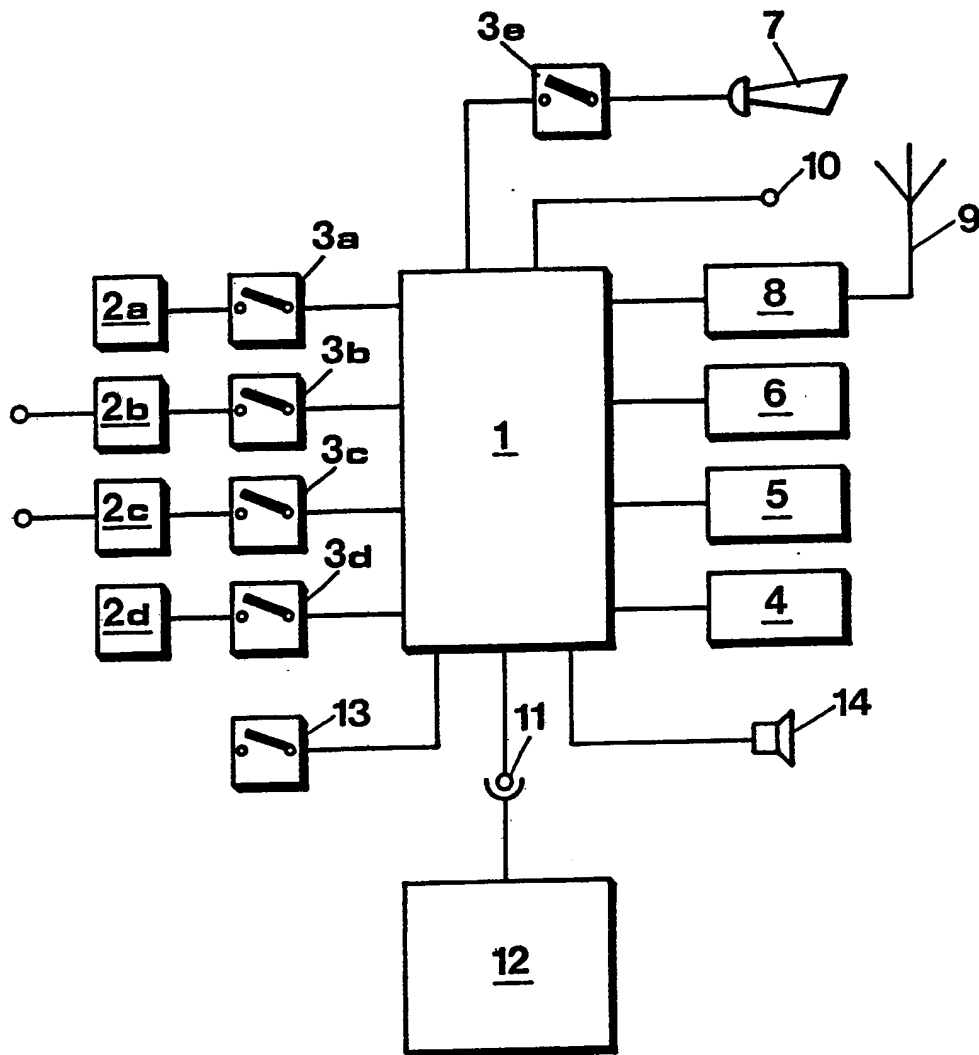
1. A control unit, incorporating at least one alarm detector and at least one function switch for connecting and disconnecting said alarm detectors,
c h a r a c t e r i z e d t h e r e b y,
that a data memory (5) is arranged consecutively to register and store information about the position of the function switch (3a - d) and/or if the function state (true value) of the alarm detectors (2a - d) and the moment for the established change in these positions/states.
2. A control unit according to claim 1,
c h a r a c t e r i z e d t h e r e b y,
that the datamemory (5) is arranged to register and store the informations at recurrent times.
3. A control unit according to claim 1,
c h a r a c t e r i z e d t h e r e b y,
that the data memory (5) is arranged to register and store the informations continuously.
4. A control unit according to claim 1,
c h a r a c t e r i z e d t h e r e b y,
that the data memory (5) is arranged to register and store the informations each time a change in state occurs.
5. A control unit according to one of the preceding claims,
c h a r a c t e r i z e d t h e r e b y,
that the data memory (5) incorporates a semi-conductor memory.
6. A control unit according to one or more of the preceding claims,
c h a r a c t e r i z e d t h e r e b y,
that the data memory (5) incorporates a tape memory.
7. A control unit according to one or more of the preceding claims,



c h a r a c t e r i z e d t h e r e b y ,
that the data memory incorporates a disk memory.



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INTERNATIONAL SEARCH REPORT

International Application No PCT/SE84/00076

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ² According to International Patent Classification (IPC) or to both National Classification and IPC 3 <div style="margin-top: 10px; font-family: monospace; font-size: 1.2em;">G 08 B 13/00, 29/00</div>											
II. FIELDS SEARCHED <div style="text-align: center; margin-top: 10px;">Minimum Documentation Searched ⁴</div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%;">Classification System</th> <th style="width: 75%;">Classification Symbols</th> </tr> <tr> <td style="padding: 5px;">IPC 3</td> <td style="padding: 5px;">G 08 B 13/00, 26/00, 29/00</td> </tr> <tr> <td style="padding: 5px;">US C1</td> <td style="padding: 5px;">340:409, 506, 541</td> </tr> </table> <div style="text-align: center; margin-top: 10px;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched ⁵</div> <div style="margin-top: 20px; font-family: monospace; font-size: 1.2em;">SE, NO, DK, FI classes as above</div>			Classification System	Classification Symbols	IPC 3	G 08 B 13/00, 26/00, 29/00	US C1	340:409, 506, 541			
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US C1	340:409, 506, 541										
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴ <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Category ⁶</th> <th style="width: 60%;">Citation of Document, ¹⁵ with indication, where appropriate, of the relevant passages ¹⁷</th> <th style="width: 30%;">Relevant to Claim No. ¹⁸</th> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">EP, A1, 4 910 (SIEMENS AKTIENGESELLSCHAFT) 31 October 1979</td> <td></td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">E</td> <td style="padding: 5px;">SE, A, 8205068-3 (PROGRATOR INNOVATION AB) 8 March 1984</td> <td></td> </tr> </table>			Category ⁶	Citation of Document, ¹⁵ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸	A	EP, A1, 4 910 (SIEMENS AKTIENGESELLSCHAFT) 31 October 1979		E	SE, A, 8205068-3 (PROGRATOR INNOVATION AB) 8 March 1984	
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<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>[*] Special categories of cited documents: ¹⁶</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div>											
IV. CERTIFICATION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> Date of the Actual Completion of the International Search ⁸ <div style="text-align: center; font-family: monospace; font-size: 1.2em;">1984-09-25</div> </td> <td style="width: 50%; padding: 5px;"> Date of Mailing of this International Search Report ⁹ <div style="text-align: center; font-family: monospace; font-size: 1.2em;">1984-09-28</div> </td> </tr> <tr> <td style="width: 50%; padding: 5px;"> International Searching Authority ¹ Swedish Patent Office </td> <td style="width: 50%; padding: 5px;"> Signature of Authorized Officer ¹⁰ <div style="text-align: center;"> Roland Landström </div> </td> </tr> </table>			Date of the Actual Completion of the International Search ⁸ <div style="text-align: center; font-family: monospace; font-size: 1.2em;">1984-09-25</div>	Date of Mailing of this International Search Report ⁹ <div style="text-align: center; font-family: monospace; font-size: 1.2em;">1984-09-28</div>	International Searching Authority ¹ Swedish Patent Office	Signature of Authorized Officer ¹⁰ <div style="text-align: center;"> Roland Landström </div>					
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